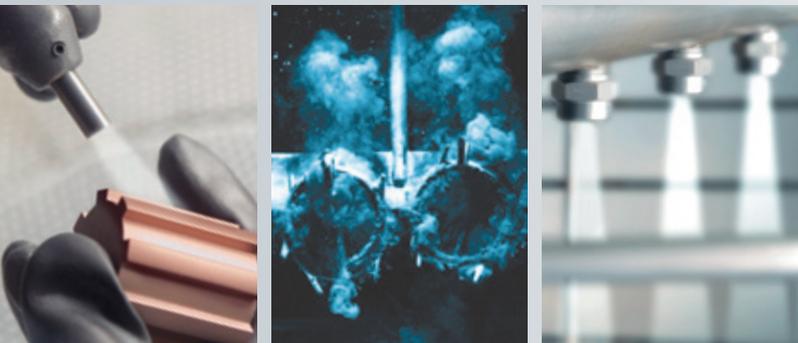




More Precision, more Productivity more Cleanliness.



- Lapp-blasting technology
 - Ultrasonic cleaning technology
 - Spray-cleaning technology
- ... for targeted surface treatment and effective and efficient cleaning.





HGH Lapp-blasting technology – targeted surface treatment for any user.

For use in mould and die making, profiling and mechanical engineering:

The application possibilities for the HGH lapp-blasting technology are many fold. One of the prime requirements for processing all types of technically demanding surfaces is a reproducible blasting process as well as the right choice of blasting medium. Be it in our factory or on-site at your premises, our experts will provide you with the correct advice as well as extensive training for the correct application of lapp-blasting technology in order to carry out targeted improvements on the surfaces of parts.

We have constantly adapted our machines and blasting media to the increasing demands of the user through many years of continuous development work on our blasting units and in particular our blasting media.

This know-how – which we have developed over decades – can be found in each HGH lapp-blasting unit and provides you with many benefits in most areas of application.

- **Two-step blasting process for removing the white layer**
- **Surface compacting**
- **Cleaning of tools**
- **Reducing surface roughness**
- **Structuring of moulds**
- **Cleaning of extrusion screws**
- **Increasing sliding properties**
- **Solving release problems**
- **Conversion of surface tensile stresses into compressional stress**
- **Cleaning of electrodes**
- **Visual improvement**



Injector blasting technology – automatically controlled, highly precise, for consistently reproducible blasting results

Consistently precise and guaranteed reproducible blasting results:

HGH injector blast cabinets operate using a vacuum system. This is evident from the two hoses which lead to the pistol. As part of this vacuum systems the r.p.m. of the blower motor are controlled by means of a potentiometer. The blower motor produces the vacuum in the system – monitored by a control board – and sucks in air from outside through the intake vents in

the cover. The vacuum which is also created in the pistol has the effect of drawing the blasting media into the pistol body and ensuring that it reaches the workpiece via the tungsten carbide jet nozzles.

Should the pressure conditions in the cabinet change this will be noted by the control board and automatically adjusted. This ensures constant pressure conditions when blasting. This technology, together with the separation

of blasting media (cyclone), guarantees always reproducible blasting results for the user.

The injector blast process is perfect for use in the following areas:

- Automotive industry
- Mechanical engineering
- Mould and die making
- Glass industry
- Aerospace industry

As a Single or Duo – small or large: Lapp-blasting units for every requirement.



The “small” units with a BIG performance.

There are 3 single injector units available for all types of application. Here only one blasting medium is used.

Features of the units:

- hinged front cover
- top cover with safety switch, can be raised 90° upwards
- viewing window with 3-pane thickness
- internal pane can be changed easily with quick-release-system
- infinitely variable blower
- blasting media recycling system

HGH 6040	Dimensions in mm
Working chamber	590 x 400 x 250
Overall dimensions	705 x 700 x 1.360
HGH 7050	
Working chamber	745 x 500 x 300
Overall dimensions	855 x 830 x 1.365
HGH 8060	
Working chamber	800 x 580 x 310
Overall dimensions	955 x 935 x 1.410



Powerful DUO – more possibilities.

Two lapp-blasting units combined in one DUO provide the two-step blasting system which facilitates the targeted technical and consistently reproducible improvement of spark eroded surfaces.

Of course the DUO unit has all the benefits of the single units and allows for 2 different media to be used.

HGH 6040 DUO	Dimensions in mm
2 Working chambers	590 x 400 x 250
Overall dimensions	1.300 x 720 x 1.350
HGH 7050 DUO	
2 Working chambers	745 x 500 x 300
Overall dimensions	1.576 x 830 x 1.502



Dynamic, powerful, large volumes.

The 1000 series is the injector blast unit for use in many different applications. Other sizes are available for specific customer applications.

Features of the units:

- two torsion-free hinged doors
- integrated bright lighting with reflector
- hardened safety pane
- replaceable impact pane in a steel support frame
- blasting media recycling system

HGH 1100 I	Dimensions in mm
Working chamber	1.100 x 800 x 740
Overall dimensions	1.250 x 1.280 x 2.000
Door opening	690 x 620
HGH 1300 I	
Working chamber	1.370 x 890 x 810
Overall dimensions	1.520 x 1.400 x 2.080
Door opening	790 x 690
HGH 1700 I	
Working chamber	1.700 x 1.400 x 1.100
Overall dimensions	1.850 x 2.080 x 2.350
Door opening	1.290 x 990

Pressure blasting technology – perform heavy duty tasks or delicate processing with power and precision.

High pressure and accuracy for results which can be reproduced at any time:

The HGH pressure blasting units are constructed in such a way that behind the cabinet there is a pressure tank in which the blasting media is prepared with the compressed air.

The blend of blasting media and air is then transferred through a hose directly to the pistol and then onto the workpiece. Our pressure blast units have a cyclone separator so that the user always has reproducible results.

Because the blasting media is mixed directly with the compressed air the discharge pressure is around 7 times higher than with injector blasting. As a result pressure blast technology is ideally suited for: **cleaning applications, structuring and deep contours.**

Large working chambers and compact small units as retrofits.



A lot of space for powerful blasting.

The 1000 series as a power blast unit. Individual cabinet sizes are available to meet your specific requirements.

These units offer the following benefits in addition to those of the injector units:

- protective wear-resistant curtain on back wall of blasting chamber
- PVC protection on the insides of the cabinet doors

HGH 1100 D	Dimensions in mm
Working chamber	1.100 x 800 x 740
Overall dimensions	1.250 x 1.280 x 2.000
Door opening	690 x 620
HGH 1300 D	
Working chamber	1.370 x 890 x 810
Overall dimensions	1.520 x 1.400 x 2.080
Door opening	790 x 690
HGH 1700 D	
Working chamber	1.700 x 1.400 x 1.100
Overall dimensions	1.850 x 2.080 x 2.350
Door opening	1.290 x 990



The delicate and powerful series!

The Microläpp 100 or 200 is a small blasting unit for the pin-point blasting and processing of small slits and small drill holes. Blasting medium with grit sizes of between 1 to 300 µm is only used once to ensure reproducibility. This small accessory unit is a wonderful addition to all existing blasting units.

HGH Microläpp 100	Dimensions in mm
Overall dimensions	200 x 200 x 230
Jet nozzle	Ø 1,2
Blast media container	1 piece
HGH Microläpp 200	
Overall dimensions	300 x 300 x 230
Jet nozzle	Ø 1,2
Blast media container	2 piece

The right grit for every application – our blasting media.

HGH blasting media can be widely used and are suitable for every type of cabinet. HGH has over 30 different blasting media which have been developed by us.

Starting with fine blasting media with a nominal grit size of 15 µm for the targeted improvement of surfaces through coarse blasting media with a nominal grit size of e.g. 1 mm for structuring work or ceramic blends for design work, plastic granules for cleaning

extrusion screws, HGH delivers the right medium for the desired application.

In the table on the right you can find an overview of the popular blasting media and their applications. Other blasting media are available to suit your application. We at HGH are constantly updating and developing our range of blast media to meet the requirements of our customers.

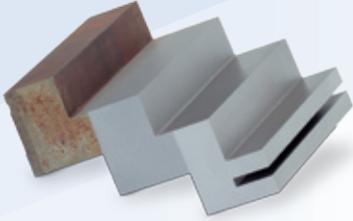


Lapp-blasting – a multitude of possible applications.

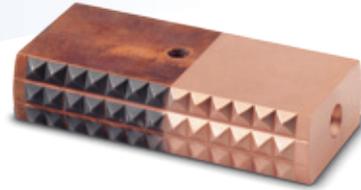
There are many possible applications for blasting technology. The decisive factors influencing the process are the size of the workpiece and the

desired finish or the desired level of cleanliness. Here is a small selection of process examples.

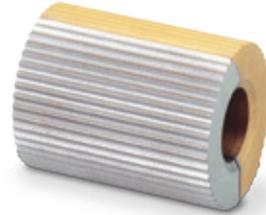
If your particular application is not listed please get in touch with us. We will surely find the right solution for you.



Blasting of an eroded surface using the 2-step process to remove the white layer and to increase wear-resistance



Cleaning of an electrode to extend the operating life, to inspect for surface damage and to improve the spark process



Surface treatment as preparation for coating



Cleaning of a zinc die-cast mould with subsequent surface compaction to reduce mould release problems



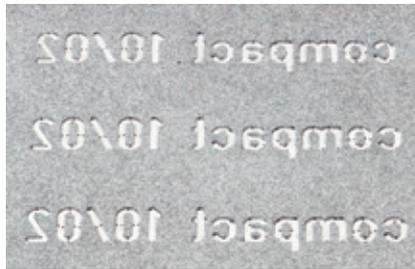
Cleaning of plastic extrusion screws to decrease down-time in the injection moulding machine



Removal of surface rust or other residual matter



Structuring of aluminium surfaces



Structuring of surfaces in moulds



Processing and structuring of glass surfaces

Medium	Grit size	Areas of Application
SM 2000 A	15 – 25 µ	First step for fine surface processing under Ra 0.6 µm
SM 2001 A	20 – 40 µ	Preparation for polishing, removal of white layer from spark-eroded parts
SM 2002 A	50 – 70 µ	First step of a 2- or more step blasting process
SM 2552 GT	30 µ	Anti-adhesion compacting in a 2- or more step blasting process
SM 2915 A	90 µ	Priming process for electroplating deposition, priming prior to painting/lacquering
SM 2490 A	0,1 – 0,4 mm	Scale and rust removal, matt finishing, priming process for painting/lacquering work
SM 2240 A	0,4 – 1,2 mm	Paint stripping, rust removal, priming process for painting and coating operations
SM 2005 K	0,2 – 0,6 mm + 0,6 – 1,0 mm	Cleaning of extrusion screws, cylinders and moulds in plastic injection moulding and extrusion machines
SM 2552 G	30 µ	Surface finishing of surgical instruments (high-alloyed steels), priming process for hard-coating of drilling/milling tools etc.
SM 2002 G	150 – 250 µ	Surface compacting; satin finish of thermoset material, high-alloyed steels and aluminium moulds



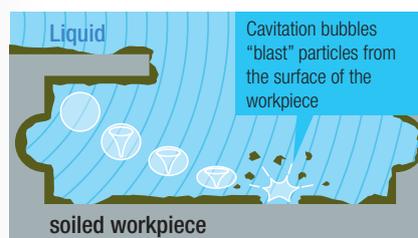
Perfected ultrasonic technology from HGH: for the best cleaning results.

The design and construction of Ultrasonic cleaning machines – decades of experience have made HGH a worldwide dependable partner in matters of industrial cleaning technology. Comprehensive laboratory trials, detailed planning and design as well as attentive construction using tried and tested high-quality components have made HGH cleaning machines a reliable link in any discerning manufacturing chain.

HGH machines can just as perfectly and reliably clean press cylinders or moulds and dies weighting tonnes as they can highly precise and delicate components for computers, medical instruments and optical parts. For many years leading German and international companies have placed their trust in our expert advice, our proven quality and our comprehensive service.

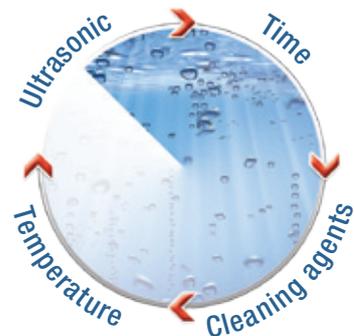
We will also find an efficient and cost-effective solution for your cleaning requirements – either from standard components or as a specific development for your special requirements.

The principle of ultrasonic cleaning is based on the production in liquid of vibrations with a frequency above approx. 18 kHz. Compression and attenuation takes place as a result of the excess pressure. The tensile forces during the attenuation phase can tear the liquid apart creating what is known as “cavitation”, expressed in the form of bubbles. These explosive-like implosions create localised high pressures and strong turbulence and currents around each cavitation bubble – dirt particles on the surface of parts submerged in the liquid are removed through this pulling action. Any “flaws” such as rough and soiled surfaces act as sources of cavitation which means that the cleaning effect is produced exactly where it is needed.



The cleaning effect can be compared with countless micro brushes working on the surface. Small and hard-to-reach areas such as drill holes, corners and undercuts can be easily accessed and cleaned with this process.

In ultrasonic cleaning there are **four factors** which influence obtaining perfect results.



- 1. Ultrasonic** creates the cavitation and generates intense forces which result in a gentle removal of the dirt particles from the parts to be cleaned.
- 2. Time** is dependent on the degree of soiling and can vary between a few seconds and several minutes.
- 3. Cleaning agents** loosen the dirt particles which are then removed by the ultrasonic.
- 4. High tank temperatures** bring out the full effect of many cleaning agents.



The cleaning by hand of dies, moulds or mass-produced parts is imprecise and costly. HGH ultrasonic cleaning technology provides for effective and efficient cleaning with automatic, semi-automatic or manual machines.

The down-time of parts can be reduced, manpower can be saved and productivity in many areas increased with perfect cleaning in just a few minutes – including in the corners! A broad range from standard single and multi-tank units up to highly complex fully-automated systems provides

the right solution for every requirement. Ultrasonic cleaning can be used in many industries and here are a few examples: :

- automotive · electronics · plastics · wire
- printing medicine · optical · mould-making
- die-making

Fully-automated ultrasonic cleaning machine

In a fully-automated machine the cleaning process and the transportation of the parts between the cleaning tanks are completely automated ...

... for example as a through-feed machine for mineral glass products

Spectacle lenses made from mineral glass or plastic are inserted into special holders and then placed on a feeder belt. A conveyor arm picks up the holder and guides it through the individual cleaning and rinsing stages of the 8-tank machine.

Directly connected to the machine is a complete clean water preparation system including ion exchangers, activated carbon and filter cartridges. The machine and the conveying of the parts are controlled by a Siemens S7 control.



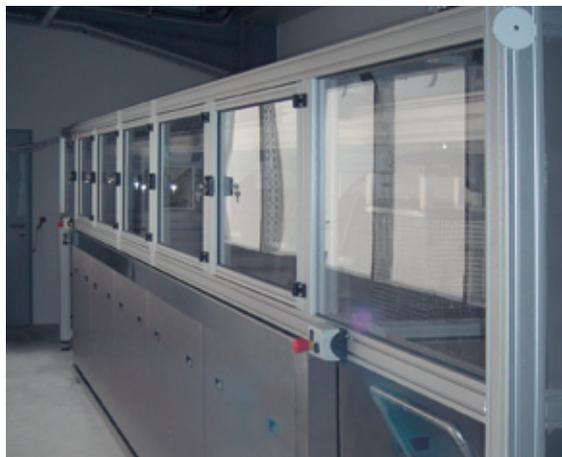
... for example for machine parts before use in the food processing industry

An 8-tank machine in which machine parts are ultrasonically cleaned, rinsed, electro-polished and dried in a continuous process. Because of the high cleanliness requirements in the food processing industry this machine has several cleaning and rinsing tanks which all operate with high-purity water. The cleaning process can be individually adjusted by means of a Siemens S7 controller. The transportation of the parts to be cleaned is executed throughout the complete machine by a conveying system with special coated holders.

... for example for the fine cleaning of tools before coating

Tools are cleaned and rinsed in this 7-tank machine before CVD or PVD coating. High demands concerning residual dirt require multi-level cleaning and rinsing. The transportation baskets are conveyed automatically through the machine.

A bleeder ring reduces carry-over from the cleaning tank into the first rinsing tank. Operating conditions can be pulled up on the touch-screen and cleaning parameters can also be changed for each tank.



Semi-automatic ultrasonic cleaning machines

Semi-automatic processes are automated insofar as only the transportation basket has to be moved manually from tank to tank or to another stage of the process, ...

... for example for degreasing and rinsing fittings and mountings

A 2-tank ultrasonic cleaning machine for degreasing and rinsing of fittings and mountings: a transportation basket, which can take loads of up to 300 kg in total, is moved by hand from tank to tank or to the loading and unloading stations.

Next to the machine is a drip zone onto which the basket is pushed after rinsing. The drip tank underneath the drip zone can be emptied by means of a ball valve. The ultrasonic generators are located in an air-conditioned control cabinet.



... for example for bulk cleaning of small stamped parts

Small stamped contact pins are cleaned and rinsed with deionised water and dried in this 4-tank machine. The goods are transported manually as bulk material from tank to tank in a polypropylene drum.

The drum is twisted on the drip zone prior to going into the dryer. The water flows from there back into the last rinsing stage. The contact strips left and right of the tanks and the drip zone provide the low-voltage current required for the rotary drum.



... for example for the automatic cleaning of plastic moulds

A 2-tank ultrasonic cleaning machine in which soiled moulds are ultrasonically cleaned and rinsed with the help of compressed air. The moulds, weighting up to 300 kg, are transported in transport baskets to the loading station of the cleaning machine by means of special tool and gear wagons. The conveyor takes the basket from the wagon and takes it through the individual stages of the process. The vertical transportation is performed by means of a frequency-controlled winch drive. At the end the moulds are manually dried on a turn-table by using a compressed-air pistol. The machine can be supplied as a fully- or a semi-automatic unit, depending on the design of the controls.



Manually-guided ultrasonic cleaning machines

Manually-guided units are designed in such a way that the transport basket is moved by hand from tank to tank by the operator. The cleaning itself is done by the ultrasound once it has been activated, ...

... for example for the removal of special coatings from metal surfaces

Two types of special coating on tools (twist drill with a PVD and TiN coating) are removed in a 3-tank machine. Two special agents facilitate a short processing time. The components are rinsed in the third tank.

The de-scaled tools can be precisely rinsed by use of a hand spray. Ultrasonic sensors guarantee the exact monitoring of the level.



... for example with standardised compact units and combinations

Our US 15 to US 90 machines are available as either single tanks or double-tank compact units. In addition to that we can supply all units from the US 40 upwards with an oil skimmer for increasing the life of the cleaning agent. A convection dryer is also included in the compact design.

Individual components can be combined into one unit with a conveyor and basket transportation system and so create a highly flexible cleaning solution from individual models.



The US Series of ultrasonic cleaning machines

Model	Dimensions/mm
US 3	225 x 125 x 80
US 15	325 x 280 x 200
US 40	395 x 395 x 240
US 60	500 x 400 x 300
US 90	600 x 400 x 400



Powerful, economical, environment-friendly: Spray-cleaning from HGH.

Spray-cleaning with best results and high cost-effectiveness –

the SR series from HGH is first choice. Large capacity in a small space thanks to a compact design and an extractable parts carrier platform, which also allows for the use of a crane – the robust SR machines are ideal for the cleaning of large parts or tools which are also heavy. The octagonal platform also facilitates the maximum possible utilisation of the cleaning chamber.

Flexibility is trumps with the availability of optional special accessories. That way it is easy to adapt your HGH spray-cleaning machine to your needs. Whether it be vapour extraction with recirculation of condensate, filtration and oil skimmer for care of cleaning agent or extractable basket with carriage or sliding cross table – you choose your optimal configuration perfectly matched to your cleaning requirement and invest directly only in that which you need.

The 4 basic models of the HGH SR Series

Typ	Racksize/ mm	eff. height/ mm	max. loading weight/kg
SR 1000	1000 x 1000	800	900
SR 1200	1200 x 1200	800	1000
SR 1400	1400 x 1400	1000	1200
SR 1600	1600 x 1600	1000	1500



From our factory in Germany we also supply **customized special solutions for special requirements**, for example machines with double doors (left) with two parts platforms for loading from both sides or through-feed cleaning machines (right).

Connecting rods, which are protected for ocean transportation, are cleaned in this through-feed spray-cleaning machine before they are combined with pistons in an assembly unit.

A pick-and-place module conveys the connecting rods from the buffer onto the goods conveyor of the cleaning machine. After drying the rods are placed in a buffer prior to further processing. The spray-cleaning is perfectly embedded into the production process.

Talk with our experts – we will also find a solution for your requirements.



Ultrasonic and Spray-cleaning from HGH: these results speak for themselves ...

Our product range is determined by the ever-increasing awareness of the quality of surface cleanliness in many sectors of industry. As a result we manufacture standard compact machines for your requirements or special machines designed solely to meet your individual wishes and requirements – at the front stands attaining the best possible cleaning result for you whilst maintaining a high degree of cost-effectiveness. To achieve this we place our team

of technical experts at your disposal, and they will evaluate the cleaning problem on-site in order to be able to propose to you a bespoke cleaning solution. We can conduct cleaning trials with possible residual dirt analysis in our laboratory prior to a visit to your facility.

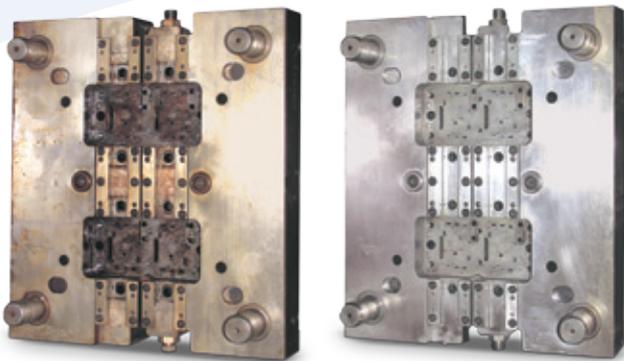
Below are cleaning results from our ultrasonic and spray-cleaning machines:

*Save time and costs
right from the start*

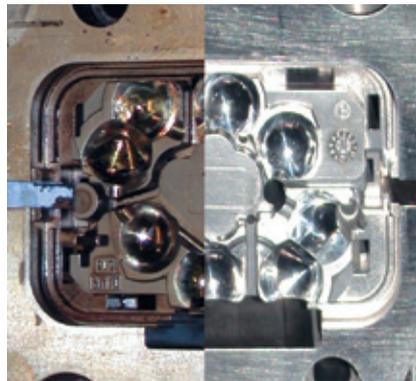
An investment in an HGH ultrasonic or spray-cleaning machine pays back very quickly:

- **tools are back in operation much quicker than with conventional cleaning by hand,**
- **tools and components maintain their value and last longer thanks to perfect cleaning,**
- **accurate cleaning reduces susceptibility to damage for moulds or production parts.**

Ultrasonic cleaning of moulds



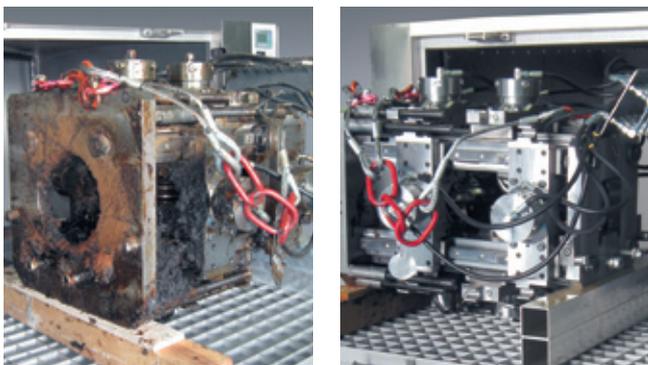
Ultrasonic cleaning of polished mould inserts



Ultrasonic cleaning of maintenance tools



Spray-cleaning of machine parts



Rust removal using spray-cleaning



HGH

HGH Total Service



HGH EDM Technology

Best performance and execution: precise, quick, reliable and economical.



Consumables and accessories

Top brands with outstanding quality for long-lasting excellent results.



HGH Lapp-blasting technology

Targeted surface treatment with a reproducible blasting process.



Tool steel

Pre-processed and precision-ground in many qualities and dimensions.



Ultrasonic and spray-cleaning technology

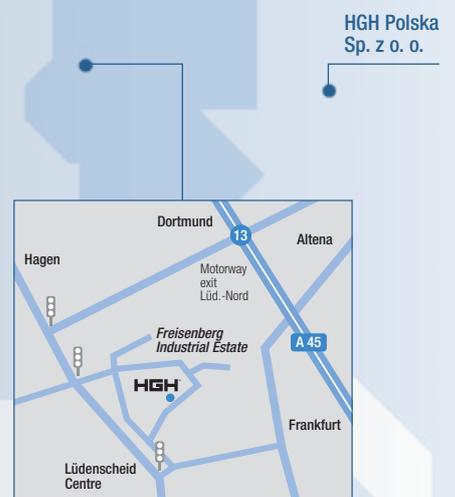
Perfect and cost-effective cleaning – as manual, semi- or fully-automatic machines.



High capabilities – strength through network



We are always there where you need us through our network of distributors and subsidiaries across Europe.



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